Juvenile Salmonid and Plankton Samples from an Inner and an Outer Estuarine Station in the Campbell River Estuary, British Columbia, 1984

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JUVENILE SALMONID FOOD AND PLANKTON SAMPLES FROM AN INNER AND AN OUTER ESTUARINE STATION IN THE CAMPBELL RIVER ESTUARY, BRITISH COLUMBIA, 1984

by

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ABSTRACT

Macdonald, J. S., G. M. Kruzynski, I. K. Birtwell, K. D. Seaman, L. Del Mistro, and M. Kotyk. 1985. Juvenile salmonid food and plankton samples from an inner and outer estuarine station in the Campbell River estuary, British Columbia, 1984. Can. Data Rep. Fish. Aquat. Sci. 520: 27 p.

Data are presented from stomack analysis of fish sampled with a beach seine and from plankton tows carried out during three trips to the Campbell River estuary in the spring and summer of 1984. Juvenile salmonid prey and planktonic organisms are chronologically itemized.

Key words: salmonid, food, plankton, stomach analysis, prey, invertebrates

RÉSUMÉ

Macdonald, J. S., G. M. Kruzynski, I. K. Birtwell, K. D. Seaman, L. Del Mistro, and M. Kotyk. 1985. Juvenile salmonid food and plankton samples from an inner and outer estuarine station in the Campbell River estuary, British Columbia, 1984. Can. Data Rep. Fish. Aquat. Sci. 520: 27 p.

On présente les données provenant de l'analyse des contenus stomacaux de poissons échantillonnés au moyen d'une senne de rivage et de coups de filet à plancton réalisés au cours de trois expéditions dans l'estuaire de la rivière Campbell au printemps et à l'été de 1984. On énumère par ordre chronologique les proies des jeunes salmonidés et les organismes planctoniques.

Mots-clés: salmonidés, nourriture, plancton, analyse du contenu stomacal, proie, invertébrés

INTRODUCTION

The estuary of the Campbell River is located on the east coast of Vancouver Island, British Columbia. Fresh water entering the estuary drains from a basin of 1741 km^2. The predominant flows are from the Campbell and Quinsam Rivers which have a combined mean annual discharge of about 108 $m^3 \cdot s^{-1}$ (Bell and Thompson 1977). Flows in the lower reaches of the Campbell River are controlled and regulated through the John Hart generating station which is located approximately 5 km upstream of the river mouth.

The Campbell River discharges into the highly turbulent marine waters of Discovery Passage, thus confining the major influence of fresh water to the "inner estuary" behind Tyee Spit (Fig. 1). Seawater intrusion due to tidal action typically creates a vertically stratified estuary of approximately 73 ha at high tide (Brownlee et al. 1984). Approximately 43 ha has been used for log handling activities, and a variety of urban and industrial activities occur in the watershed (e.g. logging, mining, housing developments).

A Campbell River project was initiated in 1982 to evaluate the use of estuarine and marine shore habitats by juvenile salmonids. In order to investigate salmonid microhabitat preferences, fish were observed by SCUBA divers (presented in a separate data report) at two estuarine sites (Fig. 1) during the summer of 1984 . In conjunction with the diver observations, surface and salt wedge waters were sampled with a modified miller net sampler to relate the abundance and availability of planktonic and drift organisms to the presence of fish at several locations within each station. Gut contents of juvenile chum, coho (wild and hatchery), chinook (wild and hatchery) salmon and cutthroat trout collected by beach seining at each site were evaluated. This report presents the results of plankton identification and stomach content analyses.

MATERIALS AND METHODS

Samples were taken from two sites during three field trips: May 28 to June 1, June 25 to June 29, and July 23 to July 27. Site 1, Painters Channel (Fig. 1), is a blind channel which remains exposed during tides greater than approximately two meters and experiences riverine influences only at high tides. This site has a shallow sloping shore and eelgrass beds at lower elevations. Site 2, North Baikie's Mouth (NBM), also has eelgrass at lower elevations, a moderate sloping shore, and marshes at high elevations. This site is located off the southwest shore of Baikie's Slough at the confluence with Campbell River.

Fish were caught with a 13.8 m beach seine with wings 4.6 m (1 cm stretched mesh), bunt 4.9 m (6 mm stretched mesh), and depth 3 m. Towlines (15 m long) were attached to the wings. A 5 m inflatable boat with a 60 h.p. engine was used to pull the net off the beach. The seine was taken 10 to 15 m offshore, depending upon local conditions.

Subsamples of the fish catches were preserved in 10% formalin for later analysis. Fork lengths (to the nearest millimetre) were measured and weights after blot drying were taken (to 0.01 gm accuracy) on a K-Tron model DS-10 balance within two months of capture. Fish stomachs were then removed and gut content weights were determined on a Mettler H43 balance.

Scuba observations of fish abundance and location and plankton sampling were performed at three stations at site 1, and five stations at site 2 (Fig. 1, Table 1). In addition, plankton samples were taken at high tide from the salt wedge below the fresh water river flow at NBM-Baikie Refuge (station 1), NBM-mid (station 3) and Painters-mid (Station 6).

All plankton samples were replicated four times with modified miller net samplers. The samplers consisted of two high speed miller net samplers attached parallel to each other 40 cm apart. Each had a mouth diameter of 11.5 cm and 350 µm net. For surface samples the miller samplers were suspended from a floating frame work that held the mouth of the sampler at water level. The Miller samplers were submerged to sample the salt wedge with a 3 kilo lead weight suspended between the 2 sampler bodies. Plankton samples were towed behind the boat for 1 to 2 minutes at a speed of 6 $m \cdot s^{-1}$. In shallow conditions, nets were towed manually. Sample volumes for each tow were obtained from an attached flow meter. Plankton were preserved in 10% formalin.

Gut contents and plankton samples were examined with a Wild M 5 dissecting scope. Specimens of major taxonomic groups were enumerated, arranged chronologically and sorted by sample station. Plankton samples were corrected to obtain counts per cubic meter.

RESULTS

In total, eight salmonid species were identified and 55 plankton and prey taxa were recorded. Results are presented in Table 3, under the variable codes described in Table 2. Values of the variable volume in cases describing fish predators and the variables fork length (FL-MM), weight (WT-GM) and gut weight (gut wt) in cases describing plankton samples are missing (Tables 2 and 3). Missing values are described with a series of nines.

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Table 1. Description of study stations in the Campbell River estuary (depths are given for 3.3 m tides)

Station	Description
1. NBM-Baikie Refuge	- slough habitat; low flow; refuge area from river current; 1 m deep.
2. NBM-north	- on left bank; exposed to river current; 1 m deep.
3. NBM-mid	- midchannel; strong river current at low tide; salt wedge (2 m deep) present at high tide; depth - 4 meters.
4. NBM-south	- on right bank above marsh island #1; exposed to river current; 1 m deep.
5. Painters-west	- on foreshore edge of channel; 3 m deep.
6. Painters-mid	- in midchannel; depth = 4 m.
7. Painters-east	- on right bank; depth = 3 m.
8. NBM-shear	- in confluence of Campbell River and Baikie's Slough.

Table 2. Gut content and plankton code definitions

NUM - fish number

SPP - fish species:

1 = pink salmon	5 = sockeye salmon
2 = chum salmon	6 = wild chinook salmon
3 = wild coho salmon	7 = hatchery chinook salmon
4 = hatchery coho	8 = cutthroat trout

DAT - collection date:

1 = May 28 - June 1 (early)
2 = June 25, 29 (mid)
3 = July 23, 27 (late)

TIDE - tide condition at time of collection:

1 = low tide
2 = high tide

SITE - site of collection:

1 = Painters Channel
2 = North Baikie Mouth

STN - collection station at either site:

1 = NBM = Baikie Refuge	5 = Painters Channel - west
2 = NBM = north	6 = Painters Channel - mid
3 = NBM = mid	7 = Painters Channel - east
4 = NBM = south	8 = NBM - shear

FL-MM - fork length (mm)

WT-GM - fish weight (gm)

GUT WT - weight of gut contents (gm)

GRP - indicates unique combination of the following: fish species, collection date, tide condition, site, station, sampler type.

STYPE - sampler type"

1 = beach seine
2 = Mundie sampler
3 = Seamac sampler

VOLUME - volume (m^3) of plankton sample.

GNOR - Gnorimosphaeroma oregonensis

BOS - Bosmina sp.

NEPL - Neocalanus plumchrus

HARP - Harpacticoid

CYSP - Cyclops sp.

CAL - Calanoid

CORJ - Corophium sp. juvenile

CORS - Corophium sp.

EOG - Eogammarus sp.

PONT - Pontogeneiidae

PARA - Parathemisto sp.

GAM - Unidentified gammarid

CAP - Caprellid

TAN - Tanaidacean

CUVU - Cumella vulgaris

MEG - Megalops

ZOE - Zoea larva

EUPL - Euphausid larva

EUPH - Euphausid

MYSID - Mysidacean

Table 2 (cont'd)

OST1	- Ostracod #1
OST2	- Ostracod #2
NEM	- Nematode
FISHL	- Pisces larva
FISH	- Pisces
ARAK	- Arachnid
ACAR	- Acarina
MYT	- *Mytilus* sp.
GAST	- Small gastropod
BARN	- Barnacle
LARV	- Larvacean
TENA	- Ctenophore: *Pleurobrachia* sp.
MED	- Medusa: *Aglatha* sp.
CHIRL	- Chironomid larva
CHIRP	- Chironomid pupa
CHIRA	- Chironomid adult
SIML	- Simulidae larva
MUSL	- Muscidae larva
DIPP	- Dipteran pupa
HYM	- Hymenoptera
TRI	- Trichoptera
THYS	- Thysonoptera
COLL	- Collembola
HOM	- Homoptera larva
PLEC	- Plecoptera larva
HEM	- Hemiptera
PSOC	- Psychodidae
PSOL	- Psychodidae larva
U164	- Unidentified invertebrate
UIL	- Unidentified insect larva
UIA	- Unidentified insect adult
UIF	- Unidentified fragments
GRVL	- Gravel
WOOD	- Wood
PLNT	- Plant material
CALN	- Calanoid nauplius
ISO	- Unidentified isopod (asellid)
COLEO	- Coleoptera
POLY	- Polychaete

Table 3. Gut content and plankton sample species identification. Variables with missing values are described with a series of nines.

NUM	SPP	DATE	TIME	STAT	FL MM	WT GM	GUT WT	GRP	STYPE	VOLUME	CNOR	BOS	WEPL	HARP	CYSP	CAL	CORJ	CORS	EOG	PONT	PARAM	CTAAN	CUVU	HEC
1	4	1	1	2	1	126	22.52	.1360	1	1	9.999999	2	350											
2	4	1	1	2	1	124	21.28	.0539	1	1	9.999999		7											
3	4	1	1	2	1	117	19.18	.0876	1	1	9.999999	3	22	3					1					
4	4	1	1	2	1	130	25.62	.1267	1	1	9.999999	3						1	3		1			
5	4	1	1	2	1	133	27.20	.3112	1	1	9.999999							47						
6	3	1	1	2	1	124	18.56	.0643	2	1	9.999999							6						
7	3	1	1	2	1	119	19.40	.1784	2	1	9.999999	9												
8	3	1	1	2	1	114	16.24	.1909	2	1	9.999999							30	3		2			
9	3	1	1	2	1	98	9.98	.1733	2	1	9.999999		500											
10	3	1	1	2	1	97	9.84	.1124	2	1	9.999999	5	13					1	3					
11	3	1	1	2	1	95	9.08	.1621	2	1	9.999999		50	78										
12	7	1	1	2	1	81	6.10	.0719	3	1	9.999999	1	200	12					2					
13	7	1	1	2	1	80	6.00	.1671	3	1	9.999999	4	400		1									
14	7	1	1	2	1	70	3.88	.1738	3	1	9.999999		200	67				1						
15	8	1	1	2	1	140	26.22	.6682	4	1	9.999999	1						80	4					
16	8	1	1	2	1	147	30.04	.7049	4	1	9.999999							2	38					
17	3	1	2	2	1	130	22.80	.1913	5	1	9.999999			24							1			
18	3	1	2	2	1	137	26.82	.4518	5	1	9.999999			36							2			
19	3	1	2	2	1	119	17.98	.1524	5	1	9.999999	1						26						
20	3	1	2	2	1	120	16.96	.1146	5	1	9.999999		175			3								
21	3	1	2	2	1	129	20.78	.9658	5	1	9.999999													
22	3	1	2	2	1	130	23.72	.1384	5	1	9.999999							2						
23	3	1	2	2	1	114	17.40	.3081	5	1	9.999999			250							2		3	
24	3	1	2	2	1	115	15.18	.0743	5	1	9.999999		300											
25	3	1	2	2	1	126	20.38	.4506	5	1	9.999999			2				72						
26	3	1	2	2	1	124	16.74	.6431	5	1	9.999999			2				4	1	100				
27	2	1	2	2	1	104	12.38	.1954	6	1	9.999999		500	7										
28	7	1	2	2	1	76	5.66	.1642	7	1	9.999999		125	250				3						1
29	7	1	2	2	1	77	4.82	.1164	7	1	9.999999		118	70				1						
30	7	1	2	2	1	82	6.02	.1362	7	1	9.999999		70	115				1						1
31	7	1	2	2	1	78	4.64	.1885	7	1	9.999999			140				2	2	2	1			
32	7	1	2	2	1	86	7.30	.1554	7	1	9.999999		75	102					1					2
33	7	1	2	2	1	81	6.50	.0923	7	1	9.999999	1	95	22										
34	7	1	2	2	1	87	6.92	.0809	7	1	9.999999		33	57										
35	7	1	2	2	1	78	5.14	.2189	7	1	9.999999		84	91							1	1		
36	7	1	2	2	1	77	5.86	.1284	7	1	9.999999	1	150	75				1			2			
37	7	1	2	2	1	82	6.38	.1403	7	1	9.999999		88	86										
38	7	1	2	2	1	77	6.72	.2766	7	1	9.999999		200	300				1						
39	7	1	2	2	1	83	7.00	.2868	7	1	9.999999		250	175					1					
40	7	1	2	2	1	85	7.46	.2415	7	1	9.999999		130	150				11	2		1			
41	7	1	2	2	1	77	4.76	.1112	7	1	9.999999		27	47				1						1
42	7	1	2	2	1	82	6.48	.1184	7	1	9.999999		100	50										
43	7	1	2	2	1	85	6.50	.2901	7	1	9.999999		137	350				2						
44	7	1	2	2	1	78	5.44	.1389	7	1	9.999999		300	66										4
45	7	1	2	2	1	76	5.22	.1076	7	1	9.999999		375	12										

Table 3 (cont'd)

Z	E U P E	E P P I	M Y S I D	O S T T I	O S T T 2	F I N M	P S I L	A A S A H	A R C A K	M A Y T	G S T	B R B V	L T E A	C H I P	C H I P	C I I A	S M I L	D U I S	T H Y L	T H Y L	C O R M	H L O E	P H E M	P O O C	P S S L	U I U 4	U I 6 L	U U I A	G R O F	W O N L	P L D T	C A L N	C O I O	P L O Y
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	2														2	1																		
1	6			7											4	2	1																	
	1				34										1		1																	
1				1											4														2					
	8	1													3	4		2																
1	3			6	1										2																			
3	1			1																														

Table 3 (cont'd)

NUM	SPP	DAT	TIDE	SEX	FL MM	WT GM	GUT WT	GRP	STYP E	VOLUME	CNOR	BOS	NEPL	HARP	CYSP	CAL	CORJ	CROS	EOG	PONT	PARA	AGAM	CTAP	CUVU	MEG
46	7	1	2	2	1	82	5.90	.0897	7	1	9.999999		125	62											2
47	6	1	2	2	1	46	1.26	.0794	8	1	9.999999		100	300											
48	6	1	2	2	1	55	2.24	.1020	8	1	9.999999		300												
49	6	1	2	2	1	52	1.58	.0817	8	1	9.999999		350												
50	6	1	2	2	1	55	2.02	.0275	8	1	9.999999		175												
51	6	1	2	2	1	54	1.98	.0790	8	1	9.999999		250												
52	6	1	2	2	1	49	1.40	.0448	8	1	9.999999		100												
53	6	1	2	2	1	45	1.06	.0527	8	1	9.999999		125												
54	6	1	2	2	1	47	1.18	.0593	8	1	9.999999		250												
55	6	1	2	2	1	44	1.08	.0300	8	1	9.999999		150					4	3						
56	6	1	2	2	1	47	1.44	.1049	8	1	9.999999		150	120											
57	6	1	2	2	1	49	1.44	.0776	8	1	9.999999		350												
58	6	1	2	2	1	48	1.30	.0338	8	1	9.999999		175												
59	6	1	2	2	1	50	1.60	.0853	8	1	9.999999		400												
60	6	1	2	2	1	41	0.82	.0287	8	1	9.999999		225												
61	3	2	1	2	1	103	10.44	.2849	9	1	9.999999	16						8	3						
62	3	2	1	2	1	102	11.58	.1557	9	1	9.999999	11	100					2	3						
63	3	2	1	2	1	119	15.02	.2152	9	1	9.999999		4												
64	3	2	1	2	1	102	11.70	.1605	9	1	9.999999	8													
65	3	2	1	2	1	110	14.56	.1652	9	1	9.999999	1	2						1						
66	3	2	1	2	1	114	16.14	.1593	9	1	9.999999	6	1					1				1			
67	3	2	1	2	1	99	11.04	.0768	9	1	9.999999								9						
68	3	2	1	2	1	96	9.34	.2777	9	1	9.999999	28	75					2							
69	3	2	1	2	1	119	14.84	.2419	9	1	9.999999	23						1							
70	3	2	1	2	1	108	13.48	.1029	9	1	9.999999	3													
71	2	2	1	2	1	87	5.94	.0542	10	1	9.999999		275												
72	2	2	1	2	1	77	3.92	.0267	10	1	9.999999		175					1							
73	2	2	1	2	1	66	2.58	.0328	10	1	9.999999		225												
74	6	2	1	2	1	63	2.94	.0235	11	1	9.999999		75												
75	6	2	1	2	1	72	4.28	.0934	11	1	9.999999		150												
76	6	2	1	2	1	68	3.58	.0736	11	1	9.999999		150				1								
77	6	2	1	2	1	72	3.18	.0262	11	1	9.999999		75			1									
78	6	2	1	2	1	55	1.92	.0343	11	1	9.999999		75			2									
79	6	2	1	2	1	68	3.14	.0171	11	1	9.999999		75												
80	6	2	1	2	1	68	3.30	.0221	11	1	9.999999		39												
81	6	2	1	2	1	55	1.42	.0157	11	1	9.999999		85					1							
82	6	2	1	2	1	63	2.92	.0298	11	1	9.999999		175				1								
83	6	2	1	2	1	67	3.16	.0130	11	1	9.999999		24				1								
84	6	2	1	2	1	65	2.92	.0300	11	1	9.999999		75												
85	6	2	1	2	1	77	4.90	.0284	11	1	9.999999		53												
86	6	2	1	2	1	74	4.02	.0381	11	1	9.999999		24												
87	6	2	1	2	1	68	2.94	.0356	11	1	9.999999		125												
88	6	2	1	2	1	59	2.22	.0180	11	1	9.999999		85				1								
89	6	2	1	2	1	54	1.68	.0285	11	1	9.999999		125												
90	6	2	1	2	1	73	4.48	.0345	11	1	9.999999		100												

Table 3 (cont'd)

ZONE	EUPLH	EUPID	MYSTI	OSTI	OSTZ	FNEML	IFSHK	FAAAR	CAAAT	MAYT	GAASTN	BKRVA	LTEDL	CHIER	CHIRPA	CHIIMLP	SMUSPI	DIHPM	TTHSI	CHOLSL	PHLOEMC	PHE	PPSOCL	SSOOL	UIU4L	UUIAF	GWROLDT	PPOLON	CALSN	COPAILOSEOOY
1				2	48									1												1				
	2													2	1															
		2																												
																2														
																1						1								
	1			1										2	1						1					1				
		2												1	1															
																					1									
															2											1				
				23										1							1				1					
																1										1				
														2					1						2					
																									1					
									1																					
														2												1	1			
														1												1				
		2				2																								
				1																										
				4											2				1											
					1																									
														1												1				
				1										2																
														1																
																										1				
																											1			
1	17			4										1																
																										2				
																										2				
				3																						1				
																									1					
																										1				
														1	1															
		1																							1					
															1								4							
																							2							
														1													1			

Table 3 (cont'd)

NUM	SPP	DATE	TIDE	SITE	SEX	FL MM	WT GM	GUT WT	GRP	STYPE	VOLUME	GNOR	BOS	NEPL	HARP	CYSP	CAL	CORJ	CORS	EOG	PONT	PARAM	GAAMP	CTAN	CUVU	NEG
91	6	2	1	2	1	63	2.54	.0104	11	1	9.999999		40						1							
92	6	2	1	2	1	58	1.68	.0081	11	1	9.999999		55					1								
93	6	2	1	2	1	55	1.66	.0192	11	1	9.999999		175		3											
94	6	2	2	2	1	93	8.44	.0654	12	1	9.999999	1	60						1							
95	6	2	2	2	1	75	4.22	.0960	12	1	9.999999		19					3								
96	6	2	2	2	1	66	3.16	.0305	12	1	9.999999															
97	6	2	2	2	1	61	2.34	.0342	12	1	9.999999															
98	2	2	2	2	1	75	4.40	.1848	13	1	9.999999			73								4				
99	2	2	2	2	1	79	5.10	.0837	13	1	9.999999		9	250								2				
100	2	2	2	2	1	74	4.04	.0652	13	1	9.999999			124												
101	2	2	2	2	1	77	4.92	.1457	13	1	9.999999															
102	2	2	2	2	1	65	2.74	.1019	13	1	9.999999		200	1												
103	2	2	2	2	1	68	2.96	.0408	13	1	9.999999			116								2				
104	2	2	2	2	1	66	2.56	.0304	13	1	9.999999		75	46												
105	2	2	2	2	1	69	3.38	.1021	13	1	9.999999		53									1				
106	6	2	2	2	1	69	3.81	.0202	14	1	9.999999		12	7	1											
107	6	2	2	2	1	67	3.22	.0313	14	1	9.999999		5	49	2				1			1				
108	6	2	2	2	1	78	4.68	.0762	14	1	9.999999		44	51								1				
109	6	2	2	2	1	58	2.14	.0750	14	1	9.999999															
110	6	2	2	2	1	78	5.38	.0590	14	1	9.999999		53	50												
111	6	2	2	2	1	58	2.12	.0188	14	1	9.999999		16	21												
112	6	2	2	2	1	71	3.80	.0216	14	1	9.999999		2	8												
113	6	2	2	2	1	60	2.44	.0203	14	1	9.999999		14	19												
114	6	2	2	2	1	72	4.22	.0447	14	1	9.999999	1	37	6	3											
115	6	2	2	2	1	64	3.00	.0154	14	1	9.999999		2													
116	6	2	2	2	1	66	2.86	.0457	14	1	9.999999		22	48	8							3				
117	6	2	2	2	1	70	3.62	.0384	14	1	9.999999		82	36	2			1				2				
118	6	2	2	2	1	50	1.30	.0494	14	1	9.999999															
119	3	2	2	2	1	111	17.00	.4631	15	1	9.999999	20														
120	3	2	2	2	1	117	15.64	.1420	15	1	9.999999	5														
121	3	2	2	2	1	95	10.82	.1066	15	1	9.999999	3	16	1				1		1		1				
122	3	2	2	2	1	102	10.72	.0558	15	1	9.999999		115		8											
123	3	2	2	2	1	103	12.18	.1410	15	1	9.999999	1	15						7	2						
124	3	2	2	2	1	105	11.56	.2911	15	1	9.999999			20	1							10				1
125	3	2	2	2	1	110	11.26	.0733	15	1	9.999999	1		6					1							
126	3	2	2	2	1	129	15.26	.0945	15	1	9.999999	1														
127	3	2	2	2	1	113	14.96	.2827	15	1	9.999999		75						1							
128	3	2	2	2	1	104	12.44	.2013	15	1	9.999999	4	2					2	4							
129	3	2	2	2	1	98	9.16	.1213	15	1	9.999999	3	100	13				1		1						
130	3	2	2	2	1	108	13.34	.1507	15	1	9.999999				4	2							3			
131	3	2	2	2	1	99	9.54	.0332	15	1	9.999999			1												
132	3	2	2	2	1	99	9.64	.0677	15	1	9.999999		35	9	5											2
133	3	2	2	2	1	112	10.18	.0459	15	1	9.999999															
134	3	2	2	2	1	103	11.56	.1229	15	1	9.999999		17		4											
135	3	2	2	2	1	106	11.82	.1560	15	1	9.999999		200													

Table 3 (cont'd)

ZOE	EUPLH	EUPID	MYSTI	OSTO1	OSTT2	NSEML	IFAHS	FAIRAK	CAAR	MAYT	GSTN	BKKV	LRNA	TEAD	CHIL	CHIP	CIIA	HIIL	SRRP	MSAL	UIPP	DMYL	HTKM	YTIS	TCHL	HOLM	PLOC	HLEM	PPHE	SSOC	OOL	1U6L	UUIA	GIVF	WOLD	PNT	CAL	COOL	PLOY
															2																			1	3					
																																	1						
				1											1											1							1							
																4									1				1	7	3									
								1								11													4	2				;						
	1																																							
27			1																																					
19			12																																					
19			1																																					
1																																			1				
			1																																				
13			2																																					
3																																							
37																																			1				
3									1																														
26	16		1																																				
1	3		13				1															1		1				6	3				2					
									1							17						9	1	1				2	5	1									
	4		11																																				
4	6		2																																				
	16																																						
4	11																																						
3			2		1														1																				
																																			1				
24	6		17																																	1				
10	13		3																																				
																7					9				1	1	5	3				7							
																																				1				
			1						1																									1						
	1		1												1																									
	10		2																																					
			2																																					
48			1						1																												1	1			
9			6																																					
																	1																								
																																						1			
					4																																				
	4		18												1																									
		7																																						
																																				1				
12																	1																			1	1		1		
8																																								
	3		1												1																								1		

Table 3 (cont'd)

NUM	SPP	ADT	TIDE	SIT	STN	FL MM	WT GM	GUT WT	GRP	STYPE	VOLUME	GNOR	BOS	NEPL	HARP	CYSP	CAL	CORJ	CORS	EOG	PONT	PARAM	AGAP	CTAN	CUVU	MEG
136	3	2	2	2	1	104	12.94	.1303	15	1	9.999999	3	4	3						1						1
137	3	2	1	1	7	143	20.88	.0380	16	1	9.999999				6										37	
138	2	2	1	1	7	69	3.08	.2037	17	1	9.999999			1	500										2	
139	2	2	1	1	7	98	6.36	.0297	17	1	9.999999				1											
140	2	2	1	1	7	89	6.58	.0525	17	1	9.999999				50										1	
141	2	2	1	1	7	73	3.22	.0154	17	1	9.999999				26										17	
142	2	2	1	1	7	66	2.66	.0595	17	1	9.999999				12										97	
143	2	2	1	1	7	64	2.38	.1028	17	1	9.999999				400										2	
144	2	2	1	1	7	48	0.92	.0149	17	1	9.999999				2										1	
145	2	2	1	1	7	73	3.30	.1364	17	1	9.999999				17										290	
146	2	2	1	1	7	67	2.70	.2023	17	1	9.999999				500										2	
147	2	2	1	1	7	60	1.88	.0723	17	1	9.999999				325										16	
148	2	2	1	1	7	61	2.00	.0162	17	1	9.999999				20										8	
149	2	2	1	1	7	67	2.32	.0544	17	1	9.999999				39										100	
150	2	2	1	1	7	65	2.18	.0576	17	1	9.999999				129										94	
151	2	2	1	1	7	69	2.70	.1174	17	1	9.999999				300					1					14	
152	6	2	1	1	7	63	2.24	.0335	18	1	9.999999				85										6	
153	6	2	1	1	7	77	4.30	.0660	18	1	9.999999				79					1					127	
154	6	2	1	1	7	68	3.20	.1071	18	1	9.999999				165						2			2	142	
155	6	2	1	1	7	82	5.16	.1184	18	1	9.999999				240										213	
156	6	2	1	1	7	67	2.74	.0390	18	1	9.999999				67					1				1	39	
157	6	2	1	1	7	65	2.62	.0275	18	1	9.999999				81										25	
158	6	2	1	1	7	52	1.56	.0800	18	1	9.999999				300										25	
159	6	2	1	1	7	59	2.00	.0806	18	1	9.999999				275					4	3			2	2	
160	6	2	1	1	7	65	2.78	.0400	18	1	9.999999				167										4	
161	6	2	1	1	7	55	1.56	.0600	18	1	9.999999				219					1					44	
162	6	2	1	1	7	62	2.34	.0713	18	1	9.999999				200					1						
163	6	3	1	1	7	93	8.76	.0761	19	1	9.999999				12										110	
164	6	3	1	1	7	74	4.66	.2952	19	1	9.999999				8										500	
165	6	3	1	1	7	96	9.82	.0496	19	1	9.999999														52	
166	6	3	1	1	7	95	8.42	.0281	19	1	9.999999				12								1		5	
167	6	3	1	1	7	72	4.24	.0791	19	1	9.999999				5			1							12	
168	6	3	1	1	7	80	6.26	.0386	19	1	9.999999				22										13	
169	6	3	1	1	7	90	7.34	.0400	19	1	9.999999														53	
170	6	3	1	1	7	74	4.28	.0259	19	1	9.999999				43			1							8	
171	6	3	1	1	7	83	5.62	.0362	19	1	9.999999			3	166										4	
172	6	3	1	1	7	85	6.32	.0495	19	1	9.999999			2	83										2	
173	6	3	1	1	7	85	6.70	.0312	19	1	9.999999				3										22	
174	6	3	1	1	7	84	5.84	.0362	19	1	9.999999			2	48			1							11	
175	3	3	1	2	1	111	19.30	.8756	20	1	9.999999	60														
176	3	3	1	2	1	107	15.40	.1168	20	1	9.999999	2							5	5						
177	3	3	1	2	1	109	16.40	.2137	20	1	9.999999	6							1	4						
178	3	3	1	2	1	120	22.82	.1076	20	1	9.999999								2							
179	3	3	1	2	1	100	12.96	.0069	20	1	9.999999															
180	3	3	1	2	1	110	12.78	.2678	20	1	9.999999	7	1													

Table 3 (cont'd)

ZOE	EUPLH	MYSIDD	OSTT1	OSTT2	FIFAA NSIRC EHSAA MLHKR	GBLT AAAE SRRN TNVA	CHMI RRDL	CCHHSMD IIIUIH RRMSPY PALLPM	TC THOHL LOEE ISLMC	PPH SSO OOE CLM	UI6I4L	GWPCOP UURVOL AILOO IIVON LSEEL AFLDT NOOYY
	3	3										
												1
3												
							1					
	1 1											
		2										
		1										
							10	1				
							6					
							7					
							3					
							2					
		1					1					
								1				
							4					
							8					
							8		2			
									2		1	
							2				3	1
	1						2				1	
	2						2			1	1	
							17				3	
							4			1		
	1						6					
							37				2	
							40		1			
							9					
	1						22					
												1
							2					
							1 3					
												1
												1
												1

Table 3 (cont'd)

NUM	SPP	DATE	TIDE	STN	FL MM	WT GM	GUT WT	GRP	STYPE	VOLUME	GNOR	BOS	NEPL	HARP	CYSP	CAL	CORJ	COOS	EOC	PONT	PAGRAM	CTAAPN	CUVU	MEG
181	3	3	1	2	110	14.24	.0718	20	1	9.999999	1								1					
182	6	3	1	2	88	8.46	.0621	21	1	9.999999								12	3					
183	6	3	1	2	61	2.60	.0240	21	1	9.999999		75												
184	6	3	1	2	81	6.46	.1194	21	1	9.999999														
185	6	3	1	2	71	3.68	.0533	21	1	9.999999		12											1	
186	6	3	1	2	64	2.68	.0297	21	1	9.999999								2						
187	6	3	1	2	67	3.32	.1144	21	1	9.999999								33	5					
188	6	3	1	2	72	3.46	.0100	21	1	9.999999		1												
189	6	3	1	2	63	2.64	.1043	21	1	9.999999	1						22		4					
190	3	1	1	1	110	14.86	.1518	22	1	9.999999									1				298	
191	2	1	1	1	124	17.50	.0980	22	1	9.999999											3	1	68	
192	3	1	1	1	113	16.26	.0649	22	1	9.999999											1		70	
193	3	1	1	1	109	12.76	.0474	22	1	9.999999													9	
194	3	1	1	1	96	9.64	.1138	22	1	9.999999			6											
195	7	1	1	1	79	5.82	.0537	23	1	9.999999			1										67	
196	7	1	1	1	90	8.92	.2172	23	1	9.999999	5		10					1			9		17	
197	7	1	1	1	70	4.22	.0872	23	1	9.999999			8										1	
198	2	1	1	1	86	6.46	.1450	24	1	9.999999			15										200	
199	2	1	1	1	75	3.70	.0840	24	1	9.999999			7	1									25	
200	2	1	1	1	79	4.56	.0591	24	1	9.999999			11	1									48	
201	2	1	1	1	66	2.78	.0343	24	1	9.999999				102									2	
202	3	1	1	1	65	2.94	.0220	25	1	9.999999			8	1										
203	3	1	1	1	58	2.36	.0296	25	1	9.999999				91					2				1	
204	3	1	1	1	54	1.96	.0429	25	1	9.999999				121					2				9	
205	3	1	1	1	54	1.90	.0825	25	1	9.999999				132					2				7	
206	3	1	1	1	53	1.76	.0095	25	1	9.999999											1			
207	3	1	1	1	54	1.70	.0077	25	1	9.999999				1									4	
208	3	1	1	1	47	1.18	.0081	25	1	9.999999														
209	3	1	1	1	42	0.82	.0112	25	1	9.999999														
210	3	1	1	1	45	1.04	.0081	25	1	9.999999														
211	3	1	1	1	39	0.58	.0047	25	1	9.999999													1	
212	3	1	1	1	40	0.68	.0033	25	1	9.999999														
999	9	1	1	2	999	99.99	.9999	26	2	0.458022		373			14	3	1							
999	9	1	1	2	999	99.99	.9999	26	2	0.762906	1	840			44	10	2					1		
999	9	1	1	2	999	99.99	.9999	26	2	0.762906	9	252			15	2	2		1		1			
999	9	1	1	2	999	99.99	.9999	26	2	0.762906	5	900			84	6		1						
999	9	1	2	2	999	99.99	.9999	27	2	0.350909		797			38	6								
999	9	1	2	2	999	99.99	.9999	27	2	0.350909		678			31	3	1							
999	9	1	2	2	999	99.99	.9999	27	2	0.350909		729			36	2								
999	9	1	2	2	999	99.99	.9999	27	2	0.371830		893			34	10								
999	9	1	1	2	999	99.99	.9999	28	2	0.302094		485			19	3			1					
999	9	1	1	2	999	99.99	.9999	28	2	0.302094		524			17	10	2							
999	9	1	1	2	999	99.99	.9999	28	2	0.302094		634			45	4								
999	9	1	1	2	999	99.99	.9999	28	2	0.302094		407			27	4								
999	9	1	2	2	999	99.99	.9999	29	2	0.355093		1029			55	7								

Table 3 (cont'd)

Z O E	E U P L	E U P H	M Y S I D	O S T I	O S T 2	F I E M	F A S H	A I R K	A C A R	M Y T	G A S T	B A R N	L E R A	T M E D	C H I L	C H I L	C H I L	S M I P	D I S L	T H Y M	C H Y L	P H O E	P H L M	H S S C	P P O L	S S O L	U I 6 4	U U I L	G U I A	W R V F	P O N L	C L S N	C I L O	C O P Y
															1											1								
																3	1																	
																									1								
																									1		5	8					
																									1		2	3					
															1										1			2					
																3									1				1	9			
																													1				
																3												6	1	2				
																2																	
	1																														1	1	
																													1				
																1			1										1				
	2															1																	
											14																			1			
	2					1																											
																3																	
						1										1																	
																4															1		
																2							5						1				
																1			1														
	1															1														1			
																1							2										
		1																															
	1																																
										1																							
															1																		
																	1							1									
		1																															

Table 3 (cont'd)

NUM	SPP	DATE	TIDE	STN	FL MM	WT GM	GUT WT	STYPE	VOLUME	GNOR	BOS	NEPL	HARP	CYSP	CAL	CORJ	COOS	EOG	PONT	PAAM	GRAP	CTAN	CUVU	MEG
999	9	1	2	2 4	999	99.99	.9999	29 2	0.355093		861			76	4									
999	9	1	2	2 4	999	99.99	.9999	29 2	0.355093		522			29	2									
999	9	1	2	2 4	999	99.99	.9999	29 2	0.231243		275			25	3									
999	9	1	1	2 3	999	99.99	.9999	30 2	0.562905		1220			62	8	2								
999	9	1	1	2 3	999	99.99	.9999	30 2	0.562905		1062			17	9									
999	9	1	1	2 3	999	99.99	.9999	30 2	0.533337		738			42	6									
999	9	1	2	2 3	999	99.99	.9999	31 2	0.512695		1290			60	8									
999	9	1	2	2 3	999	99.99	.9999	31 2	0.512695		1240			54	8									
999	9	1	2	2 3	999	99.99	.9999	31 2	0.512695		1322			52	4									
999	9	1	2	2 3	999	99.99	.9999	31 2	0.564300	4	494			17	461	1		4						
999	9	1	1	2 1	999	99.99	.9999	32 2	0.370156		67			5	24									
999	9	1	1	2 1	999	99.99	.9999	32 2	0.370156		222			16	7									
999	9	1	1	2 1	999	99.99	.9999	32 2	0.370156		627			87	8									
999	9	1	1	2 1	999	99.99	.9999	32 2	0.337241		255			36	5									
999	9	1	2	2 1	999	99.99	.9999	33 2	0.252164		112			67	5									
999	9	1	2	2 1	999	99.99	.9999	33 2	0.252164		163			51	1									
999	9	1	2	2 1	999	99.99	.9999	33 2	0.252164		110			76	2									
999	9	1	2	2 1	999	99.99	.9999	33 2	0.364298		74			138	2									
999	9	1	1	1 7	999	99.99	.9999	34 2	0.314368	10	2		3	2	1	1	1	2					1	
999	9	1	1	1 7	999	99.99	.9999	34 2	0.314368		2		4		3			5					1	
999	9	1	1	1 7	999	99.99	.9999	34 2	0.278942		1		4	2	2			1						
999	9	1	1	1 7	999	99.99	.9999	34 2	0.278942		4		2	3	1			10						
999	9	1	1	1 6	999	99.99	.9999	35 2	0.270295		3		4	1	2								1	
999	9	1	1	1 6	999	99.99	.9999	35 2	0.270295		2						1						1	
999	9	1	1	1 6	999	99.99	.9999	35 2	0.417855	1	3		63	1	1		1	19					1	
999	9	1	1	1 6	999	99.99	.9999	35 2	0.417855				5			1	5	65					1	
999	9	1	2	1 6	999	99.99	.9999	36 2	0.479501		678		2	154	270			1					2	
999	9	1	2	1 6	999	99.99	.9999	36 2	0.479501		366		6	76	106			4				1	3	
999	9	1	2	1 6	999	99.99	.9999	36 2	0.642961		144		2	38	12									
999	9	1	2	1 6	999	99.99	.9999	36 2	0.642961	1	130			56	15									
999	0	1	2	2 3	999	99.99	.9999	37 3	0.571831		770		6	14	942			10						
999	0	1	2	2 3	999	99.99	.9999	37 3	0.571831		1438			76	20	1								
999	0	1	2	2 3	999	99.99	.9999	37 3	0.200000		500			10	302	12		1						
999	0	1	2	2 3	999	99.99	.9999	37 3	0.200000	2	293		3	5	205	16		15						
999	0	1	2	2 3	999	99.99	.9999	38 3	0.719637		946		4	8	580	2								
999	0	1	2	2 3	999	99.99	.9999	38 3	0.719637	1	798		4	12	598									
999	0	1	2	2 3	999	99.99	.9999	38 3	1.036827		1360		4	10	700	1								
999	0	1	2	2 3	999	99.99	.9999	38 3	1.036827		886		6	6	624	2								
999	0	1	2	1 6	999	99.99	.9999	39 3	1.122497		44		4		1186			1		2				
999	0	1	2	1 6	999	99.99	.9999	39 3	1.122497	36	46		18		1388		2	30					42	
999	0	1	2	1 6	999	99.99	.9999	39 3	0.827342		32		14		318			2						
999	0	1	2	1 6	999	99.99	.9999	39 3	0.827342	2	38		6		508			12					32	
999	9	2	1	2 2	999	99.99	.9999	40 2	0.255511		173		1											
999	9	2	1	2 2	999	99.99	.9999	40 2	0.255511		214													
999	9	2	1	2 2	999	99.99	.9999	40 2	0.344214		110													

Table 3 (cont'd)

| | | |

Table 3 (cont'd)

NUM	SP	DAT	TIDE	SITN	FL MH	WT CH	CUT WT	GRP	STYPE	VOLUME	CNOR	BOS	NEPL	HARP	YSP	CAL	CORJ	CORS	EOG	PONT	PARAM	CTAPN	CUVU	MEG
999	9	2	1	2	999	99.99	.9999	40	2	0.344214		311		4	2									
999	9	2	2	2	999	99.99	.9999	41	2	1.145336		527			51									
999	9	2	2	2	999	99.99	.9999	41	2	1.145336		1444		6	86									
999	9	2	2	2	999	99.99	.9999	41	2	0.546726		1032		2	70									
999	9	2	2	2	999	99.99	.9999	41	2	0.546726		910			66									
999	9	2	1	2	999	99.99	.9999	42	2	1.227345		382			5	1								
999	9	2	1	2	999	99.99	.9999	42	2	1.227345		742			2									
999	9	2	1	2	999	99.99	.9999	42	2	0.596657		595	3	0	3									
999	9	2	1	2	999	99.99	.9999	42	2	0.596657		504	1	1	5				1					
999	9	2	2	2	999	99.99	.9999	43	2	0.914093		500	1		13		1				1			
999	9	2	2	2	999	99.99	.9999	43	2	0.914093		379			4	1	1							
999	9	2	2	2	999	99.99	.9999	43	2	0.776017		597		1	27									
999	9	2	2	2	999	99.99	.9999	43	2	0.776017		410			7									
999	9	2	1	2	1	999	99.99	.9999	44	2	0.789963		359		2	4								
999	9	2	1	2	1	999	99.99	.9999	44	2	0.789963		337		2	7	3							
999	9	2	1	2	1	999	99.99	.9999	44	2	0.816184		600			10	3	1						
999	9	2	1	2	1	999	99.99	.9999	44	2	0.816184		512	1		14								
999	9	2	2	2	1	999	99.99	.9999	45	2	1.090384		92	1		3								
999	9	2	2	2	1	999	99.99	.9999	45	2	1.090384		77			24	1							
999	9	2	2	2	1	999	99.99	.9999	45	2	0.782143		186			8								
999	9	2	2	2	1	999	99.99	.9999	45	2	0.782143				212	14								
999	9	2	1	2	4	999	99.99	.9999	46	2	0.853563		461		000	10	2	7		1				
999	9	2	1	2	4	999	99.99	.9999	46	2	0.853563		447			3		6		1				
999	9	2	1	2	4	999	99.99	.9999	46	2	0.892893		467			6		2						
999	9	2	1	2	4	999	99.99	.9999	46	2	0.892893		442					5	5	1				
999	9	2	2	2	4	999	99.99	.9999	47	2	1.418699		500			6	14							
999	9	2	2	2	4	999	99.99	.9999	47	2	1.418699		401			7	7							
999	9	2	2	2	4	999	99.99	.9999	47	2	1.104610		489			6	2							
999	9	2	2	2	4	999	99.99	.9999	47	2	1.104610		569			6	9							
999	0	2	2	2	3	999	99.99	.9999	48	3	3.683987		162				875	2		2		1		
999	0	2	2	2	3	999	99.99	.9999	48	3	3.683987		232				504			2		8		
999	0	2	2	2	3	999	99.99	.9999	48	3	0.920509		148				518					1		
999	0	2	2	2	3	999	99.99	.9999	48	3	0.920509		154				550							
999	0	2	2	2	1	999	99.99	.9999	49	3	0.877273		250				926							
999	0	2	2	2	1	999	99.99	.9999	49	3	0.877273		152				672							
999	0	2	2	2	1	999	99.99	.9999	49	3	1.066953	1	23		2		132	23		9		5		
999	0	2	2	2	1	999	99.99	.9999	49	3	1.066953				14		108	36		18		8		
999	9	2	1	1	6	999	99.99	.9999	50	2	0.612557				43		7			1				
999	9	2	1	1	6	999	99.99	.9999	50	2	0.612557				57		11			2				
999	9	2	1	1	6	999	99.99	.9999	50	2	0.630130				34		8						1	
999	9	2	1	1	6	999	99.99	.9999	50	2	0.630130				64		8			6				
999	9	2	2	1	6	999	99.99	.9999	51	2	0.463602		8		3		19							
999	9	2	2	1	6	999	99.99	.9999	51	2	0.463602		6		1		8							
999	9	2	2	1	6	999	99.99	.9999	51	2	0.533278		35		3		11							
999	9	2	2	1	6	999	99.99	.9999	51	2	0.533278		8		1		1							

Table 3 (cont'd)

ZOE	EUPLH	EUPID	MYSTI	OSTI2	OSTI2	FNSEHML	IFAAHKR	AIRCAAR	MAYT	GAASRTN	BAARNVA	LTAEMER	CHIIIRPA	CHIIIRPA	HHSMDIUIHPYMI	TCHOLYLSL	PLOZNC	HEM	PPSSOOCL	UIU4L	GWPOLVONDT	CAILSNO	COPLOOEL
			1									1											
				2																			
															1								
												1											
												2											
								1								1							
								1				2		1									
												1								1			
							2							1									
							1																
			1																				
												1								1			
												2			1								
												1											
							1					1						1		1			
				2										1									
			1									1											
								3				2											
												2										4	
																						2	
2	28		16							4	5	1	2									2	
2	8		18				1															2	2
3	14	5	20							4												2	4
4	9	36	13							2	1									1		1	6
	28		7							1												1	8
	20	1	26							1												6	6
1		61	6																			4	2
	4	54	2									2											
1	1	2	7																				
			4																				
2		2	12							1												1	
2			8							1													
	1	1												1				1				2	
																						1	
			1															1				2	
										0				0									

Table 3 (cont'd)

MEM	SPP	DATE	TIDE	SITE	FLMN	WTCM	GUTWT	GRP	STYPE	VOLUME	GNOR	BOS	NEPL	HARP	CYSP	CAL	CORJ	CORS	EOC	PONT	PARAM	CCAAPN	CUVU	MEG
999	9	2	1	1	7	999	99.99	.9999	52	2	0.310000		1		12		16			1				1
999	9	2	1	1	7	999	99.99	.9999	52	2	0.310000		3		11		20							1
999	9	2	1	1	7	999	99.99	.9999	52	2	0.310000		4		44		106			8				1
999	9	2	1	1	7	999	99.99	.9999	52	2	0.310000				23		114			6				3
999	0	2	2	1	6	999	99.99	.9999	53	3	1.151752		46		8	2	738							
999	0	2	2	1	6	999	99.99	.9999	53	3	1.151752		78				924			2	2			
999	0	2	2	1	6	999	99.99	.9999	53	3	0.828737		14		8		630							
999	0	2	2	1	6	999	99.99	.9999	53	3	0.828737		22		6		660				4			
999	9	3	1	2	1	999	99.99	.9999	54	2	1.318838		55					1						
999	9	3	1	2	1	999	99.99	.9999	54	2	1.318838		134											
999	9	3	1	2	1	999	99.99	.9999	54	2	0.984665		12											
999	9	3	1	2	1	999	99.99	.9999	54	2	0.984665		16	0	4									
999	9	3	2	2	1	999	99.99	.9999	55	2	1.066953		423		1									
999	9	3	2	2	1	999	99.99	.9999	55	2	1.244639		20	1	2									
999	9	3	2	2	1	999	99.99	.9999	55	2	1.244639		38	1										
999	9	3	1	2	3	999	99.99	.9999	56	2	1.477556		265	1										
999	9	3	1	2	3	999	99.99	.9999	56	2	1.477556		145					1		1				
999	9	3	1	2	3	999	99.99	.9999	56	2	0.543379		199	2					1	3				
999	9	3	1	2	3	999	99.99	.9999	56	2	0.543379		100											
999	9	3	2	2	3	999	99.99	.9999	57	2	1.180483		459	1		2								
999	9	3	2	2	3	999	99.99	.9999	57	2	1.180483		750	6		12								
999	9	3	2	2	3	999	99.99	.9999	57	2	1.066953		520			8								
999	9	3	2	2	3	999	99.99	.9999	57	2	1.066953		420	2										
999	9	3	1	2	4	999	99.99	.9999	58	2	0.749238		224	2	3			2		1				
999	9	3	1	2	4	999	99.99	.9999	58	2	0.749238		195	2		1				5				
999	9	3	1	2	4	999	99.99	.9999	58	2	1.235434		168	2				1						
999	9	3	1	2	4	999	99.99	.9999	58	2	1.235434		221	21	2									
999	9	3	2	2	4	999	99.99	.9999	59	2	1.563749		970			32								
999	9	3	2	2	4	999	99.99	.9999	59	2	1.563749		703			13								
999	9	3	2	2	4	999	99.99	.9999	59	2	1.659984		496	12		0								
999	9	3	2	2	4	999	99.99	.9999	59	2	1.659984		494	8										
999	9	3	1	2	8	999	99.99	.9999	60	2	1.264165		85		1			2						
999	9	3	1	2	8	999	99.99	.9999	60	2	1.264165		96	1										
999	9	3	1	2	8	999	99.99	.9999	60	2	0.980202		55	0				1		1				
999	9	3	1	2	8	999	99.99	.9999	60	2	0.980202		149	3				2						
999	9	3	2	2	8	999	99.99	.9999	61	2	1.258865		199	2		5								
999	9	3	2	2	8	999	99.99	.9999	61	2	1.258865		216	1		4								
999	9	3	2	2	8	999	99.99	.9999	61	2	1.712425		252	1		2								
999	9	3	2	2	8	999	99.99	.9999	61	2	1.712425		337			4								
999	0	3	2	2	1	999	99.99	.9999	62	3	1.387458		126		3		194							
999	0	3	2	2	1	999	99.99	.9999	62	3	1.387458		110		4		162							
999	0	3	2	2	1	999	99.99	.9999	62	3	1.234597		152		3		169							
999	0	3	2	2	1	999	99.99	.9999	62	3	1.234597		162		10		216							
999	0	3	2	2	3	999	99.99	.9999	63	3	1.237666		164				146							
999	0	3	2	2	3	999	99.99	.9999	63	3	1.237666		140		4		158				2			

Table 3 (cont'd)

| ZONE | | |

Table 3 (cont'd)

NUM	SPP	DATE	TIME	STN	FL NH	WT CM	GUT WT	GRP	STYPE	VOLUME	GNOR	BOS	NEPL	HARP	CYSP	CAL	CORJ	CORS	EOG	PONT	PARAM	CAAP	CTAN	CUVU	MEG
999	0	3	2	2	2 999	99.99	.9999	63	3	1.273370		236				152					4				
999	0	3	2	2	3 999	99.99	.9999	63	3	1.273370		190		4		146									
999	9	3	1	1	7 999	99.99	.9999	64	2	0.609209		45		7	15	17	1								
999	9	3	1	1	7 999	99.99	.9999	64	2	0.609209		37		16	11	07									
999	9	3	1	1	7 999	99.99	.9999	64	2	0.573226		17		80	12	02			1						
999	9	3	1	1	7 999	99.99	.9999	64	2	0.573226		10		38		8									
999	9	3	2	1	7 999	99.99	.9999	65	2	1.267234		212		5		3									
999	9	3	2	1	7 999	99.99	.9999	65	2	1.267234		389		8		20									
999	9	3	2	1	7 999	99.99	.9999	65	2	0.506001		129		3		8									
999	9	3	2	1	7 999	99.99	.9999	65	2	0.506001		121		1		1									
999	9	3	1	1	6 999	99.99	.9999	66	2	0.548400		11		16											
999	9	3	1	1	6 999	99.99	.9999	66	2	0.548400		2		18		2								1	
999	9	3	1	1	6 999	99.99	.9999	66	2	0.655235		2		15		8									
999	9	3	1	1	6 999	99.99	.9999	66	2	0.655235		6		8		2									
999	9	3	2	1	6 999	99.99	.9999	67	2	0.659977		82		4		4									
999	9	3	2	1	6 999	99.99	.9999	67	2	0.659977		141		1	2	3									
999	9	3	2	1	6 999	99.99	.9999	67	2	1.336411		174				4									
999	9	3	2	1	6 999	99.99	.9999	67	2	1.336411		247			2	4									
999	9	3	2	1	5 999	99.99	.9999	68	2	0.948682		5		2											
999	9	3	2	1	5 999	99.99	.9999	68	2	0.948682		6				1									
999	9	3	2	1	5 999	99.99	.9999	68	2	0.586615		9				1									
999	9	3	2	1	5 999	99.99	.9999	68	2	0.586615		5		1	2										
999	0	3	2	1	6 999	99.99	.9999	69	3	1.465282		15		35		77			1		2			4	
999	0	3	2	1	6 999	99.99	.9999	69	3	1.465282		12		48		59					2			3	
999	0	3	2	1	6 999	99.99	.9999	69	3	1.622885		10		42		20					2				
999	0	3	2	1	6 999	99.99	.9999	69	3	1.622885		17		42		70					1			1	

Table 3 (cont'd)

ZOE	EUPLH	EUPLH	MYSID	OSTI	OSTI2	FINSEHL	IFSIHK	AARSAAR	CAMRYT	GAASRTN	BAAERVA	LRRNEDL	CHIERPA	CHIIRPA	CHIIRPA	SIIMSLL	MIUSPPH	DIHTYRI	TCHOLSL	PHLOEMC	HEM	PPSSOOCL	UIU6I4L	UUIIAFL	GWPOLVONDT	CALSNO	COPLOSEOY
4				2							8	2														5	6
4											7															3	2
																											2
																											2
																											1
1																											5
																										2	2
																											5
										1																	
																											1
																											3
																											1
																											1
																		1									
					2		2																				
						1								1													
											0																1
3	1		4						1		4														1	1	1
5			6						1		3	1													1	8	
2			2								1														1	0	3
			1						2		6														1	3	

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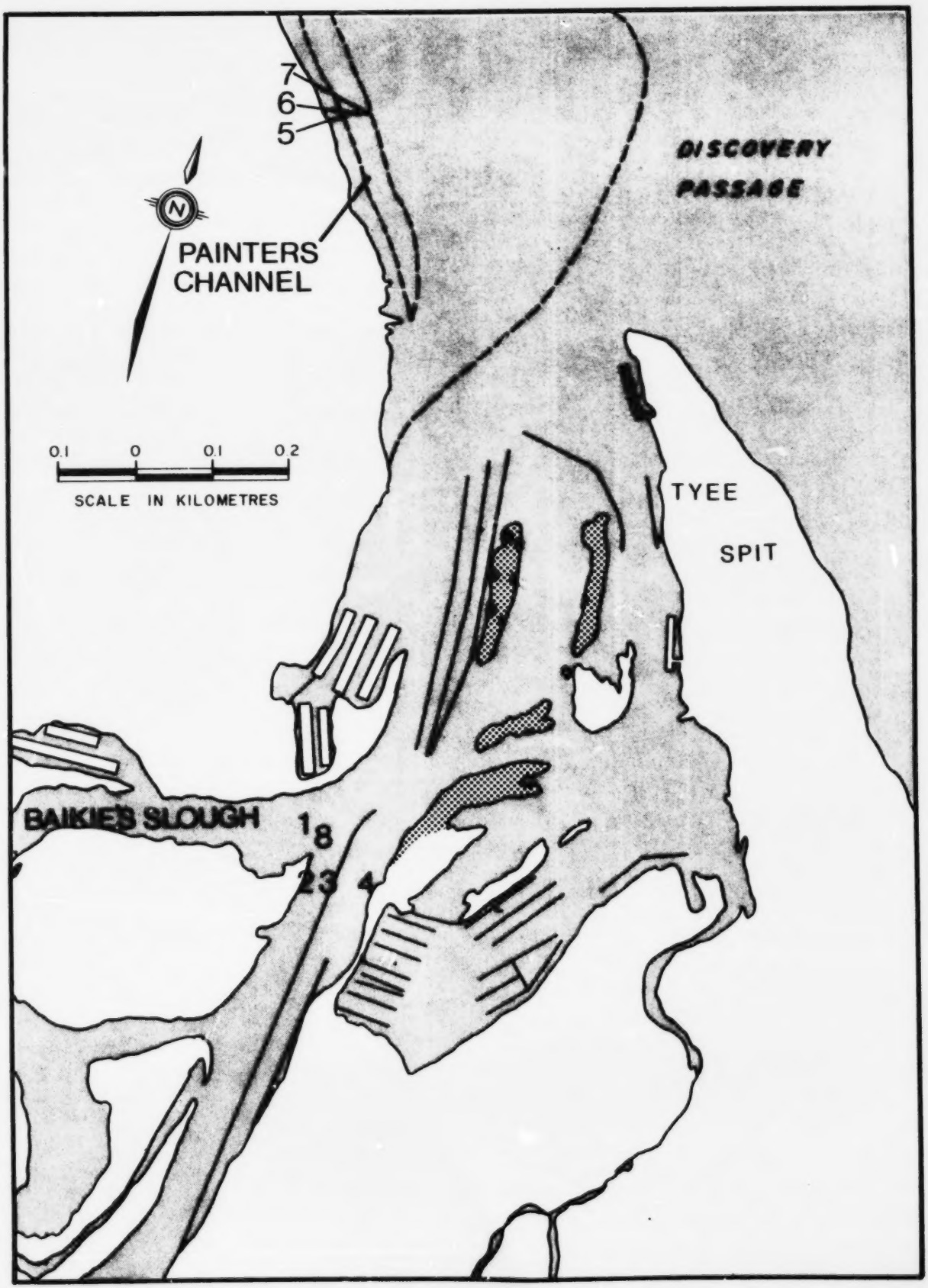
Fig. 1. Map of the Campbell River estuary showing the two sampling sites (Painters Channel and North Baikie's Slough) and the eight sampling stations (described in Table 1). The Campbell River enters the estuary from the lower left hand corner of the map.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DISCOVERY
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SCALE IN KILOMETRES
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SPIT
BAIKIE'S SLOUGH
1
8
2
3
4

POOR
QUALITY
ORIGINAL